



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,587	02/10/2005	Kazushi Wada	450100-04723	9868
7590 William S Frommer Frommer Lawrence & Haug 745 Fifth Avenue New York, NY 10151			EXAMINER TRAN, THANH Y	
			ART UNIT 2822	PAPER NUMBER
			MAIL DATE 06/05/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/521,587

Applicant(s)

KAZUSHI WADA

Examiner

Thanh Y. Tran

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 12 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 12-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-11 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***DETAILED ACTION***

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 6-7, and 10-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Kon et al (U.S. 4,688,098).

As to claim 1, Kon et al discloses a solid-state image pickup device in figures 1-2 including: a photosensor portion (“photo conductive film” 10) provided on the surface of a substrate (1) to convert incident light into electric charges (col. 2, lines 66-68); a transfer portion (“transferring section”/“storage section” 2/3) formed on the surface of said substrate to transfer said electric charges read out from said photosensor portion (col. 1, lines 5-12; col. 2, lines 52-55; and col. 3, lines 48-53); and an overflow barrier (11) formed within said substrate (1) to discharge unnecessary electric charges of said electric charges (col. 2, lines 5-10), wherein potential under said transfer portion (“transferring section”/“storage section” 2/3) is formed smaller than that formed under said photosensor portion (potential of electrode 9 formed under photosensor portion 10 is 3 V – voltage source) along the depth direction of said substrate in a range from the minimum potential position to said overflow barrier (col. 4, lines 14-50). It should be noted that: since the resistance in the transfer portion 2 is increased, this means its potential/voltage under transfer portion 2 is smaller than that formed under the photosensor portion 10 (see figures 1-2).

As to claim 2, Kon et al discloses a solid-state image pickup device in figures 1-2, wherein said transfer portion (transferring section"/"storage section" 2/3) has one or a plurality of impurity regions formed at its lower portion (see claim 6).

As to claim 3, Kon et al discloses a solid-state image pickup device in figures 1-2, wherein said photosensor portion has one or a plurality of impurity regions (regions of p type regions in 11) formed at its lower portion.

As to claim 4, Kon et al discloses a solid-state image pickup device in figures 1-2, wherein one or a plurality of second impurity regions (regions of n+, figure 2) formed under said photosensor portion (10) are formed with depths different from that of said impurity region (region 11).

As to claim 6, Kon et al discloses a solid-state image pickup device in figures 1-2, wherein said impurity region is a P type impurity region (and "p type" regions in 11) (col. 5, lines 21-22) and said second impurity region is an N type impurity region ("n+" regions in 2/3).

As to claim 7, Kon et al discloses a solid-state image pickup device in figures 1-2, wherein said potential in said overflow barrier (11) under said transfer portion (2/3) is smaller than that in said overflow barrier under said photosensor portion ("photo conductive film" 10) (potential of electrode 9 formed under photosensor portion 10 is 3 V – voltage source, and the potential corresponds to transfer portion 2/3 is smaller than that in said overflow barrier under said photosensor portion 10 because the resistance in the transfer portion 2 is increased than that in photosensor portion 10).

As to claim 10, Kon et al discloses a solid-state image pickup device in figures 1-2, wherein said substrate is composed of a first substrate (P type region of 1) and a second substrate

Art Unit: 2822

(n+ type region of 2/3) formed on an upper layer of said first substrate (P type region of 1) and which is higher in resistance (having resistance 2) than said first substrate, the first substrate (P type region of 1) being of a first conductivity type (P type), and the second substrate (n+ type region of 2/3) being of the second conductivity type (n+ type) (see figures 1-2).

As to claim 11, Kon et al discloses a solid-state image pickup device in figures 1-2, wherein said first conductivity type (n type of region 2) is N type and said second conductivity type is P type (p type of substrate 1) (see figure 2).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kon et al (U.S. 4,688,098).

As to claims 8 and 9, Kon et al does not disclose a region of the overflow barrier under the photosensor portion has a concentration lower than that of a region in the overflow barrier under the transfer portion; and wherein the overflow barrier is formed at the position deeper than 3  $\mu\text{m}$  from the surface of the substrate. However, *making a portion of overflow barrier under the photosensor portion which has a concentration lower than that of a region in the overflow barrier under the transfer portion; and forming an overflow barrier at the position deeper than 3  $\mu\text{m}$  from the surface of the substrate* would have been obvious to an ordinary artisan practicing the invention because, absent evidence of disclosure of criticality for the range giving

Art Unit: 2822

unexpected results, it is not inventive to discover optimal or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955). Furthermore, the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising therefrom. Where patentability is aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. See In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

***Allowable Subject Matter***

5. Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

6. Applicant's arguments filed on 3/12/07 have been fully considered but they are not persuasive.

Applicant argued that the barrier layer 11 of Kon et al is not an over barrier layer formed within the substrate.

In response, the examiner disagrees with applicant's argument because Kon et al clearly discloses in figures 1-2 an overflow barrier (11) which is formed within the substrate (1). The word "within" is used as a function word to indicate inclusion, location or position within limits, and Kon et al clearly discloses barrier (11) is positioned within the substrate (1) because the barrier (11) is positioned within limits of the substrate (1). The claim has never recited the

Art Unit: 2822

barrier is positioned inside the substrate, thus the claim's limitation is still broadly met by the structure of Kon et al as shown in figures 1-2.

Applicant further argued that Kon does not describe how his barrier layer 11 cooperates with the sensor structure, nor does Kon describe the operation of his barrier layer.

In response, the examiner disagrees with applicant's argument because applicant argued about the features that are not included in the claim.

Applicant further argued that Kon simply does not teach "potential under the transfer portion is formed smaller than that formed under the photosensor portion along the depth direction of the substrate...".

In response, the examiner disagrees with applicant's argument because Kon clearly discloses in figures 1-2 the potential/voltage under the transfer portion ("transferring section"/"storage section" 2/3) is formed smaller than that formed under the photosensor portion (potential of electrode 9 formed under photosensor portion 10 is 3 V – voltage source) along the depth direction of the substrate (1) in a range from the minimum potential position to the overflow barrier (11) (col. 4, lines 14-50). Applicant should note that: since the resistance in the transfer portion 2 is increased, this means its potential/voltage under transfer portion 2 is smaller than that formed under the photosensor portion 10 (see figures 1-2).

### ***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

Art Unit: 2822

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


**Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Y. Tran whose telephone number is (571) 272-2110. The examiner can normally be reached on M-F (9-6:30pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on (571) 272-2429. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TYT



M. Wilczewski  
Primary Examiner  
TC 2800